

What Is Claimed Is:

1. A method for processing a thin film sample, comprising the steps of:
  - (a) controlling a beam generator to emit at least one beam pulse;
  - 5 (b) masking the at least one beam pulse to produce at least one masked beam pulse, wherein the at least one masked beam pulse is used to irradiate at least one portion of the thin film sample;
  - (c) with the at least one masked beam pulse, irradiating the at least one portion of the film sample with sufficient intensity for the at least one portion to later  
10 crystallize; and
  - (d) allowing the at least one portion of the film sample to crystallize, the crystallized at least one portion being composed of a first area and a second area, wherein, upon the crystallization thereof, the first area includes a first set of grains, and the second area includes a second set of grains whose at least one characteristic is  
15 different from at least one characteristic of the second set of grains,  
wherein the first area surrounds the second area, and is configured to allow an active region of an electronic device to be provided at a distance therefrom.
2. The method according to claim 1, wherein the masked beam pulse has the  
20 intensity to completely melt the at least one portion of the thin film sample throughout its thickness.
3. The method according to claim 1, wherein the masked beam pulse has the  
25 intensity to partially melt the at least one portion of the thin film sample.
4. The method according to claim 1, wherein the active region of the TFT is situated within the second area.
5. The method according to claim 1, wherein the second area corresponds to at  
30 least one pixel.

6. The method according to claim 1, wherein the second area has a cross-section for facilitating thereon all portions of the TFT.

7. The method according to claim 1, wherein a size and a position of the first area with respect to the second area are provided such that the first area provides either no effect or a negligible effect on a performance of the TFT.

8. The method according to claim 1, further comprising the step of:  
(e) after step (d), determining a location of the first area so as to avoid a placement of the active region of the TFT thereon.

9. The method according to claim 1, wherein the at least one beam pulse includes a plurality of beamlets, and wherein the first and second areas are irradiated by the beamlets.

10. The method according to claim 1, wherein the thin film sample is a silicon thin film sample.

11. The method according to claim 1, wherein the thin film sample is composed of at least one of silicon and germanium.

12. The method according to claim 1, wherein the thin film sample has a thickness approximately between 100Å and 10,000Å.

13. The method according to claim 1, wherein the first set of grains provided in the first area are laterally-grown grains.

14. The method according to claim 13, wherein the laterally-grown grains of the first area are equiaxed grains.

15. The method according to claim 1, wherein the electronic device is a thin-film transistor ("TFT").

16. The method according to claim 1, wherein the thin film sample is a semiconductor thin film sample.

17. A system for processing a thin film sample, comprising:  
a processing arrangement which is configured to:

- (a) control a beam generator to emit at least one beam pulse;
- 10 (b) mask the at least one beam pulse to produce at least one masked beam pulse, wherein the at least one masked beam pulse is used to irradiate at least one portion of the film sample; and
- (c) with the at least one masked beam pulse, initiate an irradiation of the at least one portion of the film sample with sufficient intensity for the at least one portion to later crystallize

15 wherein the at least one portion of the film sample is allowed to crystallize, the crystallized at least one portion being composed of a first area and a second area, wherein, upon the crystallization thereof, the first area includes a first set of grains, and the second area includes a second set of grains whose at least one characteristic is different from at least one characteristic of the second set of grains,

20 wherein the first area surrounds the second area, and configured to allow an active region of an electronic device to be provided at a distance therefrom.

18. The system according to claim 17, wherein the masked beam pulse has the intensity to completely melt the at least one portion of the thin film sample throughout its thickness.

19. The system according to claim 18, wherein the masked beam pulse has the intensity to partially melt the at least one portion of the thin film sample.

20. The system according to claim 17, wherein the active region of the TFT is situated within the second area.

21. The system according to claim 17, wherein the second area corresponds to at least one pixel.

22. The system according to claim 17, wherein the second area has a cross-section for facilitating thereon all portions of the TFT.

23. The system according to claim 17, wherein a size and a position of the first area with respect to the second area are provided such that the first area provides either no effect or a negligible effect on a performance of the TFT.

24. The system according to claim 17, wherein the processing arrangement is further configured to, after procedure (d), determine a location of the first area so as to avoid a placement of the active region of the TFT thereon.

25. The system according to claim 17, wherein the at least one beam pulse includes a plurality of beamlets, and wherein the first and second areas are irradiated by the beamlets.

26. The system according to claim 17, wherein the thin film sample is a silicon thin film sample.

27. The system according to claim 17, wherein the thin film sample is composed of at least one of silicon and germanium.

28. The system according to claim 17, wherein the thin film sample has a thickness approximately between 100Å and 10,000Å.

29. The system according to claim 17, wherein the first set of grains provided in the first area are laterally-grown grains.

30. The system according to claim 29, wherein the laterally-grown grains of the first area are equiaxed grains.

31. The system according to claim 17, wherein the electronic device is a thin-film transistor ("TFT").

32. The system according to claim 17, wherein the thin film sample is a semiconductor thin film sample.

33. A thin film sample, comprising:

at least one section irradiated by at least one masked beam pulse which is configured to irradiate the at least one section of the sample for a later crystallization thereof,

wherein the at least one portion of the film sample is crystallized to include a first area and a second area,

wherein, upon the crystallization thereof, the first area includes a first set of grains, and the second area includes a second set of grains whose at least one characteristic is different from at least one characteristic of the second set of grains,

wherein the first area surrounds the second area, and is configured to allow an active region of an electronic device to be provided at a distance therefrom.